VERMONT
DEPARTMENT OF HEALTH

Cancer Registry
Chronic Disease Epidemiology

# Colon Cancer in Vermont

**March 2006**

## Background

Colorectal cancer is a leading cause of cancer death, second only to lung cancer among males and lung and breast cancer among females in Vermont.

Located within the digestive system, the colon and rectum make up the large bowel, or large intestine. The colon refers to the upper five or six feet of the large intestine and the rectum refers to the last five or six inches. Because of similarities between cancer of the colon and rectum, they are often grouped as colorectal cancer.

## Summary


- **Incidence:** Colorectal cancer is the third most common cancer diagnosed in men and the second most common cancer diagnosed in women. Each year approximately 176 colorectal cancer cases are diagnosed in men, and 179 colorectal cancer cases are diagnosed in women.
- **Mortality:** Colorectal cancer is the third leading cause of cancer death in both men and women. Each year, approximately 65 men and 71 women die from colorectal cancer.
- **Vermont vs. U.S.:** Vermont women have significantly higher rates of colorectal cancer incidence and mortality compared to U.S. white women. Incidence and mortality rates among Vermont men do not differ significantly from the U.S. white rates.
- **Yearly Trends:** Between 1998 and 2002 incidence rates of colorectal cancer have significantly decreased among Vermont women. There has been no significant change in colorectal cancer incidence or mortality rates among Vermont men, or mortality rates among Vermont women.
- **Gender:** In Vermont, both incidence and mortality rates of colorectal cancer are about 1.3 times higher among men than women.
- **Age:** The incidence of colorectal cancer increases dramatically with age. More than 90 percent of colorectal cancer cases are diagnosed in people aged 50 and over.
- **County:** The colorectal cancer incidence rate for females in Chittenden County is significantly higher than the U.S. female white rate. For males, there are no significant differences between Vermont county colorectal cancer incidence rates and the U.S. male white rate.
- **Stage:** In Vermont and the U.S., over half, or 57 percent, of colorectal cancers are diagnosed in late stage (either regional or distant). In Vermont 36 percent of colorectal cancers are diagnosed at the localized stage compared to 38 percent in the U.S.

# Colorectal Cancer Incidence Compared with Other Cancers

**Table 1. The most commonly diagnosed cancers in males and females* – Vermont, yearly averages 1998-2002.**

| Male Cancer Site | Cases (per year) | Percent (per year) | Female Cancer Site | Cases (per year) | Percent (per year) |
|---|---|---|---|---|---|
| Prostate | 467 | 29.3% | Breast | 477 | 31.4% |
| Lung | 242 | 15.2% | **Colon and Rectum** | **179** | **11.8%** |
| **Colon and Rectum** | **176** | **11.1%** | Lung | 173 | 11.4% |
| Bladder | 110 | 6.9% | Uterus | 102 | 6.7% |
| Melanoma | 91 | 5.7% | Melanoma | 75 | 4.9% |
| All Sites | 1,593 | 100% | All Sites | 1,517 | 100% |

- During 1998-2002, an average of 1,593 men and 1,517 women were diagnosed with invasive cancer each year in Vermont. Of those, an average of 176 men and 179 women were diagnosed with colorectal cancer per year.
- Colorectal cancer was the third most common cancer diagnosed in men after prostate and lung in Vermont and in the United States.
- Colorectal cancer was the second most common cancer diagnosed in women after breast in Vermont. In the United States, colorectal cancer was the third most common cancer diagnosed in women after breast and lung.
- Colorectal cancer accounted for roughly 11% of all cancers diagnosed in men and 12% of all cancers diagnosed in women in Vermont during 1998-2002.

# Colorectal Cancer Mortality Compared with Other Cancers

**Table 2. The most common causes of cancer death in males and females – Vermont, yearly averages 1998-2002.**

| Male Cancer Site | Deaths (per year) | Percent (per year) | Female Cancer Site | Deaths (per year) | Percent (per year) |
|---|---|---|---|---|---|
| Lung | 197 | 31.0% | Lung | 138 | 23.0% |
| **Colon and Rectum** | **65** | **10.3%** | Breast | 95 | 15.8% |
| Prostate | 65 | 10.2% | **Colon and Rectum** | **71** | **11.9%** |
| Pancreas | 35 | 5.5% | Pancreas | 31 | 5.2% |
| Non-Hodgkin Lymphoma | 29 | 4.6% | Ovary | 31 | 5.1% |
| All Sites | 635 | 100% | All Sites | 599 | 100% |

- During 1998-2002, an average of 635 men and 599 women died each year from cancer in Vermont. Of these, an average of 65 men and 71 women died each year of colorectal cancer.
- Between 1998-2002 colorectal cancer was the second leading cause of cancer death for men in Vermont. Colorectal cancer is the third leading cause of cancer death for women in Vermont and for both men and women in the U.S.
- Colorectal cancer accounted for roughly 10% of all cancer deaths in men, and 12% of all cancer deaths in women in Vermont during 1998-2002.

# Colorectal Cancer in Vermont Compared to the U.S.

**Table 3. Rates of colorectal cancer – Vermont and United States, per 100,000, yearly averages, 1998-2002.**

| | Incidence (95% CI) | Mortality (95% CI) |
|---|---|---|
| VT Males | 67.1 (*62.6, 71.8*) | 26.4 (*23.5, 29.6*) |
| U.S. Males | 62.9 | 24.2 |
| VT Females | 50.4 (*47.2, 53.9*) | 19.3 (*17.3, 21.4*) |
| U.S. Females | 46.4 | 17.0 |

*All rates are age-adjusted to the 2000 U.S. standard population. The U.S. mortality rates are based on the Vital Statistics System of the United States Public Use database. U.S. rates are 1998-2002 white population mortality rates. The U.S. incidence rates are based on the SEER Cancer Incidence Public Use Database. U.S. SEER incidence rates are 1998-2002 white population rates.*

- Between 1998 and 2002 the colorectal cancer incidence rate for females in Vermont was significantly higher than the U.S. female white rate. For males, there were no significant differences between the Vermont colorectal cancer incidence rate and the U.S. male white rate.

- Between 1998 and 2002 the colorectal cancer mortality rate for females in Vermont was significantly higher than the U.S. female white rate. For males, there were no significant differences between the Vermont colorectal cancer mortality rate and the U.S. male white rate.

# Colorectal Cancer Incidence in Vermont by County

**Table 4. Rates of colorectal cancer – Vermont by county, per 100,000, 1998-2002.**

| County | Males | Females | County | Males | Females |
|---|---|---|---|---|---|
| Addison | 63.2 | 43.3 | Lamoille | 73.5 | 43.0 |
| Bennington | 65.1 | 46.0 | Orange | 66.2 | 50.4 |
| Caledonia | 49.0 | 52.2 | Orleans | 80.7 | 46.9 |
| Chittenden | 71.4 | 55.1* | Rutland | 69.1 | 52.8 |
| Essex | 101.7 | 53.6 | Washington | 72.5 | 52.2 |
| Franklin | 80.1 | 52.6 | Windham | 62.2 | 52.3 |
| Grand Isle | 41.2 | 64.0 | Windsor | 52.3 | 44.4 |

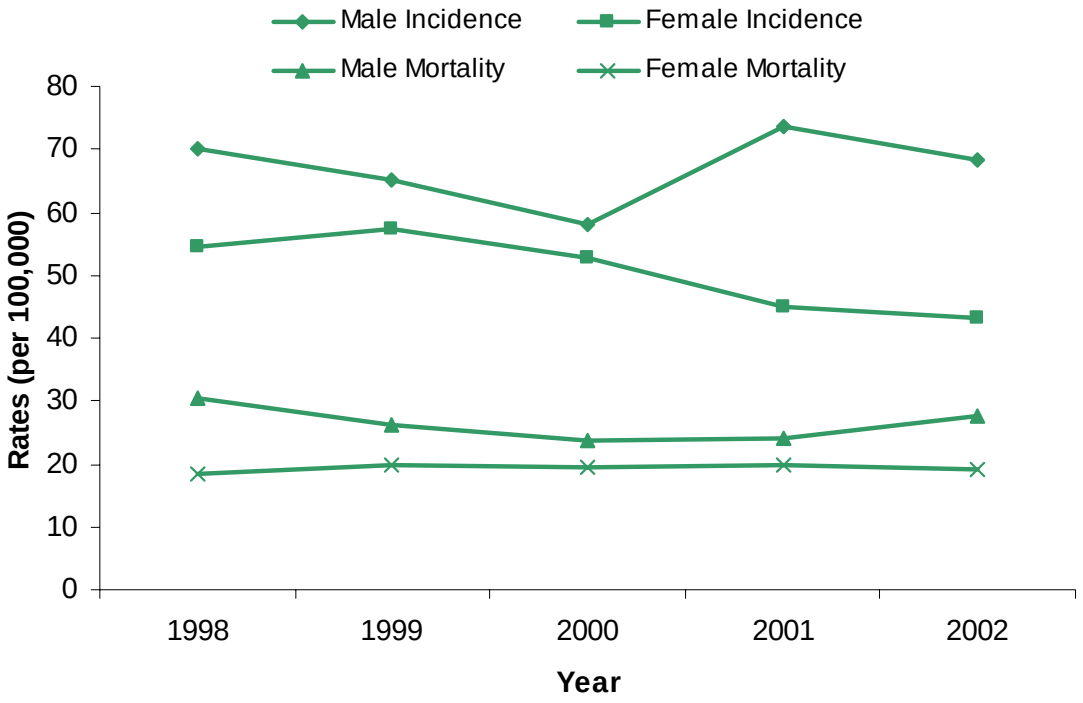
*All rates are age-adjusted to the 2000 U.S. standard population.*

** Statistically higher than the U.S.*

- During 1998-2002, the female colorectal cancer incidence rate in Chittenden County was significantly higher than the U.S. female white rate. There were no other significant differences between Vermont county rates and U.S. rates.

# Colorectal Cancer Yearly Trends

**Figure 1. Incidence and mortality of colorectal cancer, males and females – Vermont, 1998-2002.**



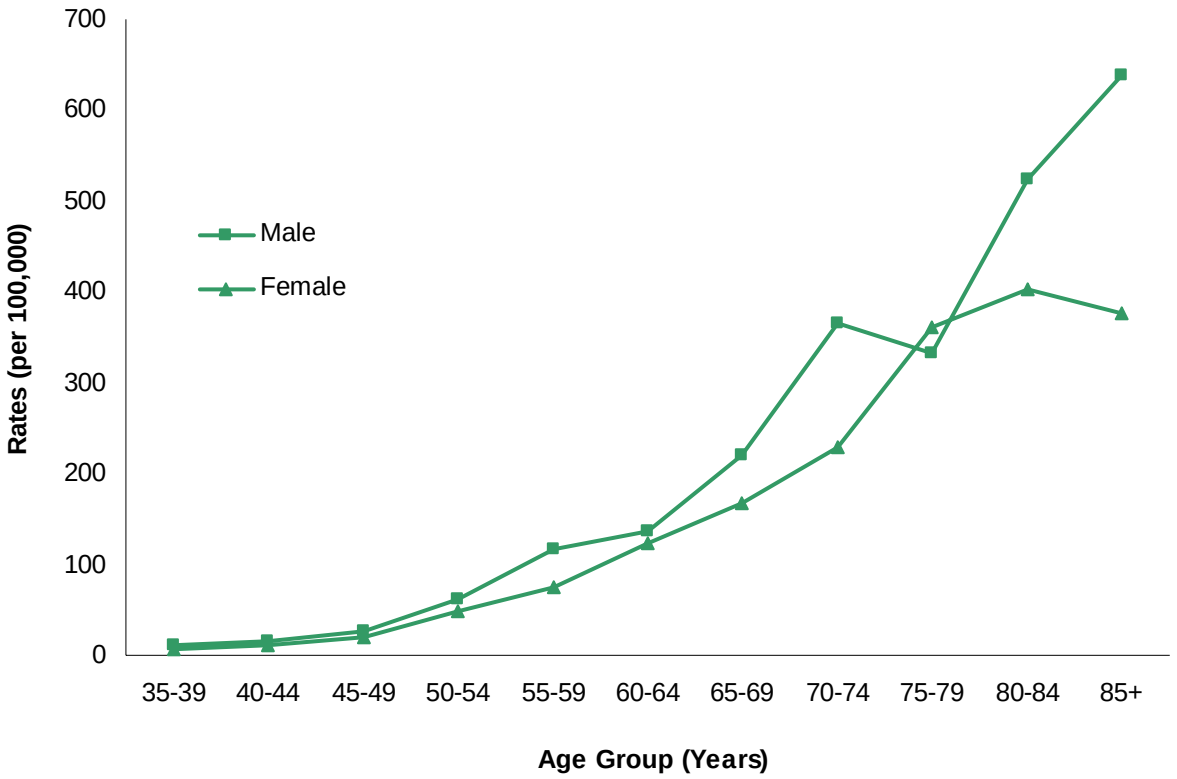

| | 1998 | 1999 | 2000 | 2001 | 2002 |
|---|---|---|---|---|---|
| Male Incidence | 70.2 | 65.0 | 57.9 | 73.8 | 68.4 |
| Male Mortality | 30.4 | 26.1 | 23.5 | 24.2 | 27.6 |
| Female Incidence | 54.6 | 57.2 | 52.7 | 44.8 | 43.3 |
| Female Mortality | 18.4 | 19.7 | 19.4 | 19.9 | 19.0 |

*All rates are per 100,000 and are age-adjusted to the 2000 U.S. Standard population.*

- From 1998 to 2002, female colorectal cancer incidence significantly decreased in Vermont. There is no significant change in male colorectal cancer incidence in Vermont.
- From 1998 to 2002, trend analysis shows that there is no significant change in male or female colorectal cancer mortality in Vermont.

# Colorectal Cancer Incidence and Age

**Figure 2. Colorectal cancer incidence rates, males and females by age – Vermont, 1998-2002.**




| Age Group | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75-79 | 80-84 | 85+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Males** | 10.3 | 16.5 | 27.4 | 62.1 | 117.3 | 136.7 | 220.3 | 364.9 | 331.9 | 525.0 | 638.1 |
| **Females** | 5.7 | 11.4 | 19.3 | 48.4 | 75.6 | 123.0 | 167.0 | 229.6 | 360.4 | 403.5 | 375.5 |

*All rates are age-adjusted to the 2000 U.S. standard population. From 1998-2002, there were only 15 cases of colorectal cancer in Vermonters younger than 35 years old. Because of the small number of cases in each age group and gender, these data are not presented. Rates are only presented when the number of cases in a particular age group is at least 6.*

- The incidence of colorectal cancer, as with many cancers, is extremely low in childhood and increases dramatically with age. Colorectal cancer is most often found among men and women over the age of 50.

- During 1998-2002, men aged 85 and older had the highest age-specific incidence of colorectal cancer, at a rate of 638.1 per 100,000. During this same time period, women age 80 to 84 the highest age-specific incidence of colorectal cancer, at a rate of 403.5 per 100,000.

## Colorectal Cancer Risk Factors

In the U.S., about 75% of all new cases of colorectal cancer occur in people with no known risks for the disease. While the exact cause of most colorectal cancers is unknown researchers have identified several risk factors that may increase a person's chance of getting colorectal cancer:

- Family History: People with a close relative (parent, brother, sister or child) who have had colorectal cancer have an increased risk of developing it.

- Certain Family Syndromes: In some families, members tend to get a type of syndrome that involves having hundreds of polyps in their colon or rectum. Cancer can develop in one or more of these polyps.

- Polyps: Polyps are growths on the inner wall of the colon or rectum. They are common in people over the age of 50. Most polyps are benign (non-cancerous) growths, but some types of polyps increase the risk of colorectal cancer, especially if they are large or if there are many of them. Screening to find and remove polyps may reduce the risk of developing colorectal cancer.

- Ethnic Background: Jews of Eastern European descent (Ashkenazi Jews) have a higher risk for developing colorectal cancer.

- Previous Cancer: Even if a person's colorectal cancer has been completely removed, new cancers may start in other areas of the colon or rectum. Women with a history of cancer of the ovary, uterus (endometrium), or breast are at a somewhat higher risk of developing colorectal cancer.

- Diet: Studies suggest that diets high in fat (especially animal fat) and low in calcium, folate, and fiber may increase the risk of colorectal cancer. Also, some studies suggest that people who eat a diet very low in fruits and vegetables may have a higher risk of colorectal cancer.

- Tobacco: A person who smokes cigarettes may be at increased risk of developing polyps and colorectal cancer.

## Colorectal Cancer Prevention and Screening

Some studies suggest that a diet low in fat and calories and high in fiber can help prevent colorectal cancer. Individuals can lower their risk of colorectal cancer by being more physically active, eating more vegetables, and getting regular screening tests.

Colorectal cancer is one of the few cancers that can be prevented through a screening test. Research shows that colorectal cancer develops gradually from benign polyps. Polyps detected by sigmoidoscopy or colonoscopy can be removed before they become malignant. Screening recommendations for people age 50 and over include:

- Fecal occult blood test (FOBT) every year, or
- Sigmoidoscopy every 5 years, or
- FOBT annually and sigmoidoscopy every 5 years, or
- Colonoscopy every 10 years, or
- Double-contrast barium enema every 5-10 years.

The 2004 Vermont Behavioral Risk Factor Surveillance System can be used to evaluate progress toward meeting these recommendations. Data show that of Vermonters over age 50:

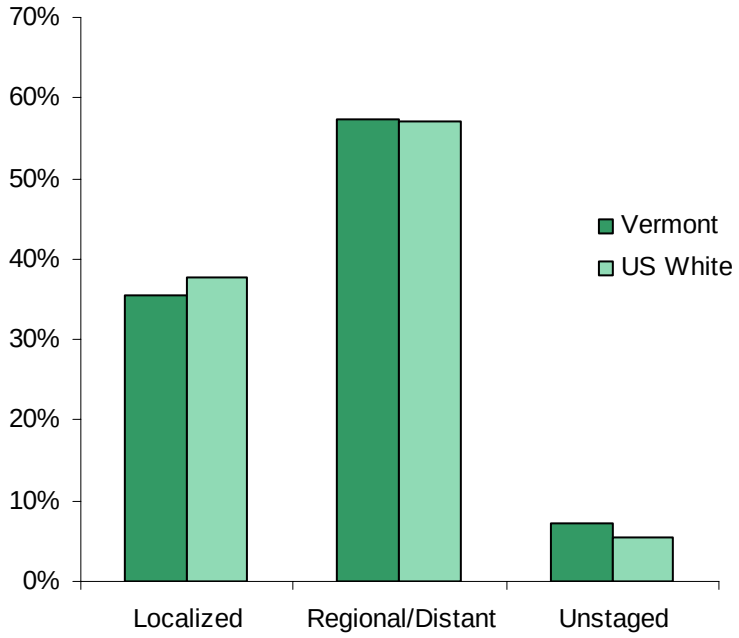
- 20% had a FOBT within the past year,
- 50% had a sigmoidoscopy or colonoscopy within the past 5 years,

- 59% had either a FOBT within the past year or a sigmoidoscopy or colonoscopy within the past 5 years, and
- **41% of Vermonters have NOT been screened for colorectal cancer following recommended guidelines.**

## Colorectal Cancer and Stage at Diagnosis

Early detection is the goal of colorectal cancer screening. If colorectal cancer is diagnosed at an earlier stage the chances for survival are greater. Nationally, 90% of men and women whose cancer is diagnosed in a localized stage survive their colorectal cancer for at least five years. Only 10% of men and women diagnosed with late stage colorectal cancer survive for at least five years.

**Figure 3. Distribution of colorectal cancer cases by stage at diagnosis*, males and females – Vermont and the United States, 1998-2002.**




**Data only includes malignant, invasive, colorectal cancer cases. Staging categories for regional and distant stages are combined due to coding changes that occurred with cases diagnosed 2001and forward.*

- During 1998-2002, only 36% of colorectal cancers were diagnosed in Vermont at the early stage (localized). In the U.S., 38% of colorectal cancers were diagnosed at the early stage.

- Over half, or 57%, of colorectal cancers were diagnosed in late stage (either regional or distant) in Vermont and the U.S. during 1998-2002.

## Data Sources

**Vermont Cancer Registry:** The Vermont Cancer Registry is a central bank of information on all cancer cases diagnosed or treated in Vermont since January 1, 1994. The registry enables the state to collect information on new cases (incidence) of cancer. Previously, the state only kept records on deaths from cancer. The information maintained by the registry allows the Health Department to study cancer trends and improve cancer education and prevention efforts. Suggested Citation: Vermont Department of Health Cancer Registry, 1998-2002. The Vermont Cancer Registry can be contacted at 802-865-7749.

**Vermont Vital Statistics:** In Vermont, towns are required to file certified copies of death certificates with the Department of Health for all deaths occurring in their jurisdictions. The Health Department is responsible for maintaining the vital statistics system. Suggested Citation: VT Department of Health Vital Statistics System, 1998-2002.

**Behavioral Risk Factor Surveillance System:** Since 1990, Vermont and 49 other states and three territories track risk behaviors using a telephone survey of adults called the Behavioral Risk Factor Survey. Suggested Citation: Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2004.

**Surveillance, Epidemiology, and End Results:** The National Cancer Institute funds a network of Surveillance, Epidemiology and End Results (SEER) registries. The SEER Program currently collects and publishes cancer incidence and survival data from 14 population-based cancer registries and three supplemental registries covering approximately 26 percent of the U.S. population. These rates are used to estimate the U.S. cancer incidence rates. U.S. incidence is based on the SEER 9 Registries white rates. Suggested Citation: Ries LAG, Eisner MP, Kosary CL, Hankey BF, Miller BA, Clegg L, Mariotto A, Feuer EJ, Edwards BK (eds). SEER Cancer Statistics Review, 1975-2002, National Cancer Institute. Bethesda, MD, 2005. http://www.seer.cancer.gov/csr/1975_2002

**U.S. Vital Statistics:** The U.S. Public Use Database Vital Statistical System maintains the U.S. mortality rates. Rates presented in this report are for the U.S. white population and were obtained using CDC Wonder. Suggested Citation: United States Department of Health and Human Services (U.S. DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis, Epidemiology, and Health Promotion (OAEHP), Compressed Mortality File (CMF) compiled from CMF 1968-1988, Series 20, No. 2A 2000, CMF 1989-1998, Series 20, No. 2E 2003 and CMF 1999-2002, Series 20, No. 2G 2004 on CDC WONDER On-line Database.

# Technical Notes and Definitions

**Age Adjustment:** All rates in this document are age-adjusted to the 2000 U.S. standard population. This allows the comparison of rates among populations having different age distributions by standardizing the age-specific rates in each population to one standard population.

**Incidence:** Incidence refers to the number or rate of newly diagnosed cases of cancer. The incidence rate is calculated as the number of new cancers diagnosed in the state during one year divided by the number of residents in the state during the same year. The incidence data presented in this report were coded using the International Classification of Disease for Oncology (ICD-O) coding system. Colorectal cancer cases were defined with ICD-O-3 codes of C18.0-C18.9, C19.9, and C20.9 with the exception of histologies 9590-9989 (or equivalent for older data).

**Mortality:** Mortality refers to the number or rate of deaths from cancer. The mortality data presented here were coded using the International Classification of Diseases (ICD). From 1999 on, cancer mortality site groupings are defined by NCHS and based on ICD-10 classification. Cause of death before 1999 was coded according to ICD-9. Comparability ratios were applied to pre-1999 mortality rates to allow for continuity in trends across the ICD revisions.

**Race:** U.S. incidence and mortality rates for whites, rather than those for all races, are used for comparison because racial minority groups were estimated to make up 3.1 percent of the total Vermont population, compared with the total U.S. non-white population of 19.6 percent in 2004. Nationwide, whites have a higher risk compared to people of other races for female breast, melanoma, and bladder cancer incidence. Whites have a lower risk compared to other races for prostate, colorectal, and cervical cancer. The much smaller populations of Vermont residents of other races may have very different risks of these cancers. Combining data over many years will be required to determine cancer rates.

**Confidence Intervals:** A confidence interval is a range of values within which the true rate is expected to fall. If the confidence intervals of two groups (such as males and females, or Vermont and the U.S.) overlap, then any difference between the two rates is not statistically significant. All rates in this report are calculated at a 95 percent confidence level. For example, the age adjusted Vermont male cancer incidence rate is 580.9 *(567.8, 594.2)* per 100,000 and the Vermont female cancer incidence rate is 446.8 *(436.7, 457.0)*. Since the Vermont female confidence interval and the Vermont male confidence interval do not overlap, a statistical difference exists between the two rates.

**Small Numbers:** Rates are not presented in this report if the number of cases is fewer than 6.

## Suggested Citation

Vermont Department of Health, Colon Cancer in Vermont, 2006.


## Acknowledgements

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## Vermonters Taking Action Against Cancer (VTAAC)

VTAAC is a statewide partnership of more than 140 individuals, professionals and organizations working together to reduce the impact of cancer on all Vermonters. A comprehensive strategic plan addressing prevention, detection, treatment, survivorship needs, and palliative care related to Vermont's leading cancers is available at www.HealthVermont.gov/Cancer or call (802) 865-7706.